LIVER TRANSPLANTATION IN AUSTRALIA

THE EXPERIENCE OF

THE AUSTRALIAN NATIONAL LIVER TRANSPLANTATION UNIT - SYDNEY
THE QUEENSLAND LIVER TRANSPLANT SERVICE - BRISBANE
THE AUSTIN HOSPITAL LIVER TRANSPLANT UNIT - MELBOURNE

UNTIL 31-12-1989

2ND REPORT
OF THE AUSTRALIAN NATIONAL LIVER TRANSPLANTATION UNIT REGISTRY
JUNE 1990

ROYAL PRINCE ALFRED HOSPITAL

UNIVERSITY OF SYDNEY

THE CHILDREN'S HOSPITAL, CAMPERDOWN

INTRODUCTION

The three established liver transplantation groups in Australia have agreed to interchange information concerning their liver transplantation experience. All three units thus have their own capability of assessing and analysing the current situation with regards liver transplantation in Australia. The groups have agreed to complete confidentiality with regards individual patients or individual units results. They have agreed, however, that overall information pertaining to Australia as a whole can be freely promulgated to interested persons.

The first report from the ANLTU Registry consisted of basic tables and graphs representing the developing experience. These tables and graphs have been updated in this second report and as the number of procedures performed in Australia continues to climb various aspects of the epidemiology of liver failure and the results of differing aspects of liver transplantation will be addressed.

We would welcome any requests for reports or for questions concerning aspects of liver transplantation in Australia which we may be able to answer.

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HISTORY

The first liver transplantation operation in Australia was performed by the Sydney University Department of Surgery - RPAH - Sydney Hospital group in 1968. No further procedures were performed until after brain-death legislation was enacted in Australia in the early 1980s. Liver transplant operations were then begun in Queensland at the Princess Alexandra Hospital in January 1985, in Sydney at the Australian National Liver Transplantation Unit in January 1986, and in Victoria at the Austin Hospital in June 1988.

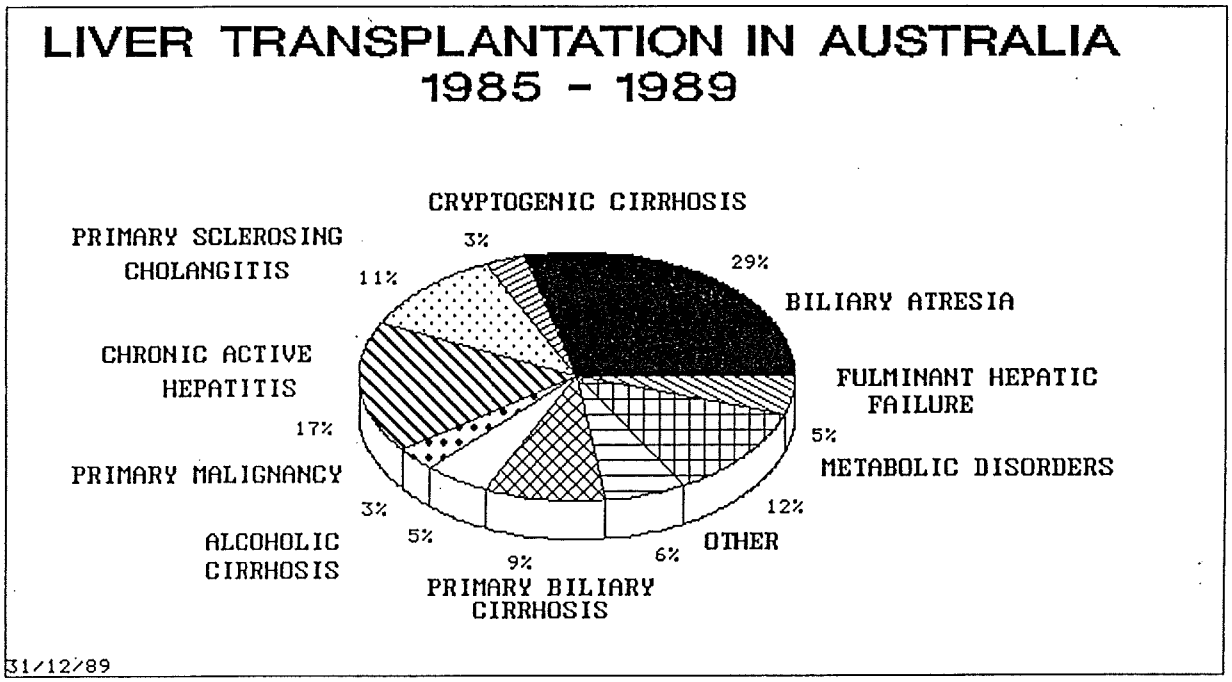


Fig. 1

This diagram shows the primary liver diseases of patients treated by transplantation in Australia. The large proportion contributed by biliary atresia is anomolous as many of these children were from Japan. The proportion of Australian patients with biliary atresia was 16%. Virtually all paediatric patients are included in the biliary atresia and metabolic disorder groups. Most adults are in the groups made up of chronic active hepatitis, primary sclerosing cholangitis, primary biliary cirrhosis, cryptogenic cirrhosis and metabolic disorders. Small numbers with alcoholic cirrhosis and primary malignancy were also treated by transplantation.

ADULTS/CHILDREN

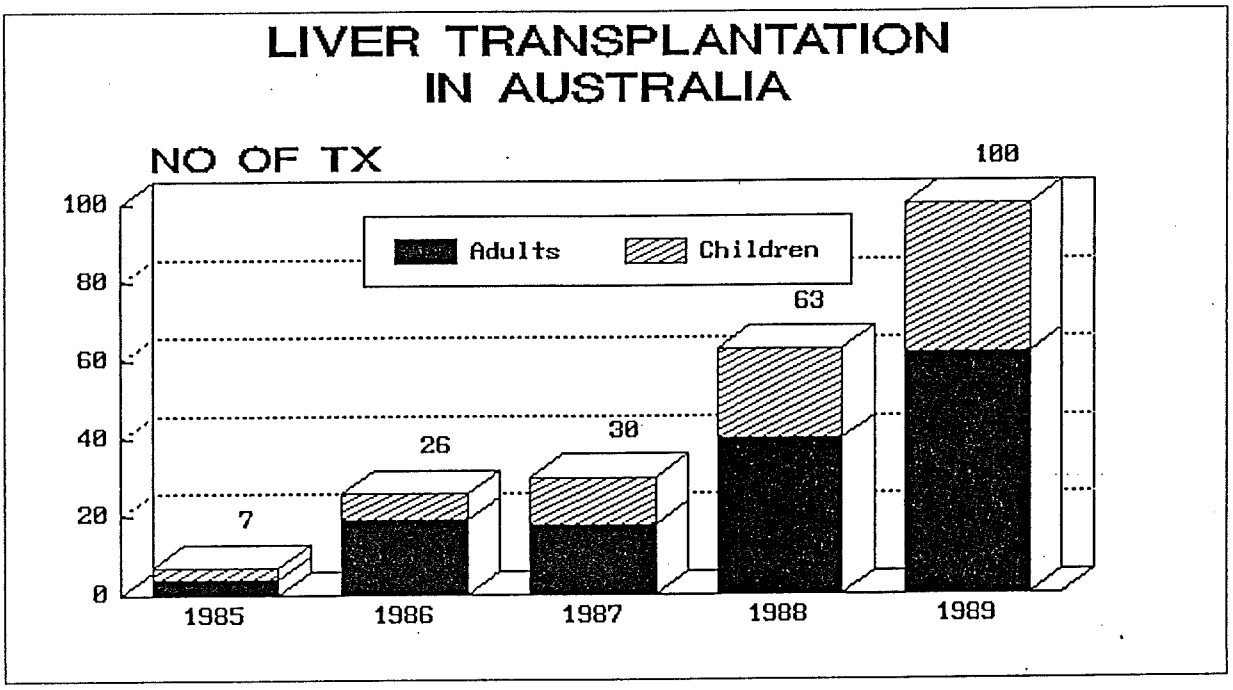


Fig. 2

In 1985 there were 7 liver transplantation procedures performed by the Queensland Unit. Since then the numbers of operations have increased rapidly until, with the 3 groups active, 100 were performed in 1989. The proportions of children treated increased following the introduction in Australia of reduced adult livers for paediatric transplantation (in Sydney in November 1986) until by 1989 40% of procedures were in children.

NUMBERS OF LIVER TRANSPLANTATION OPERATIONS

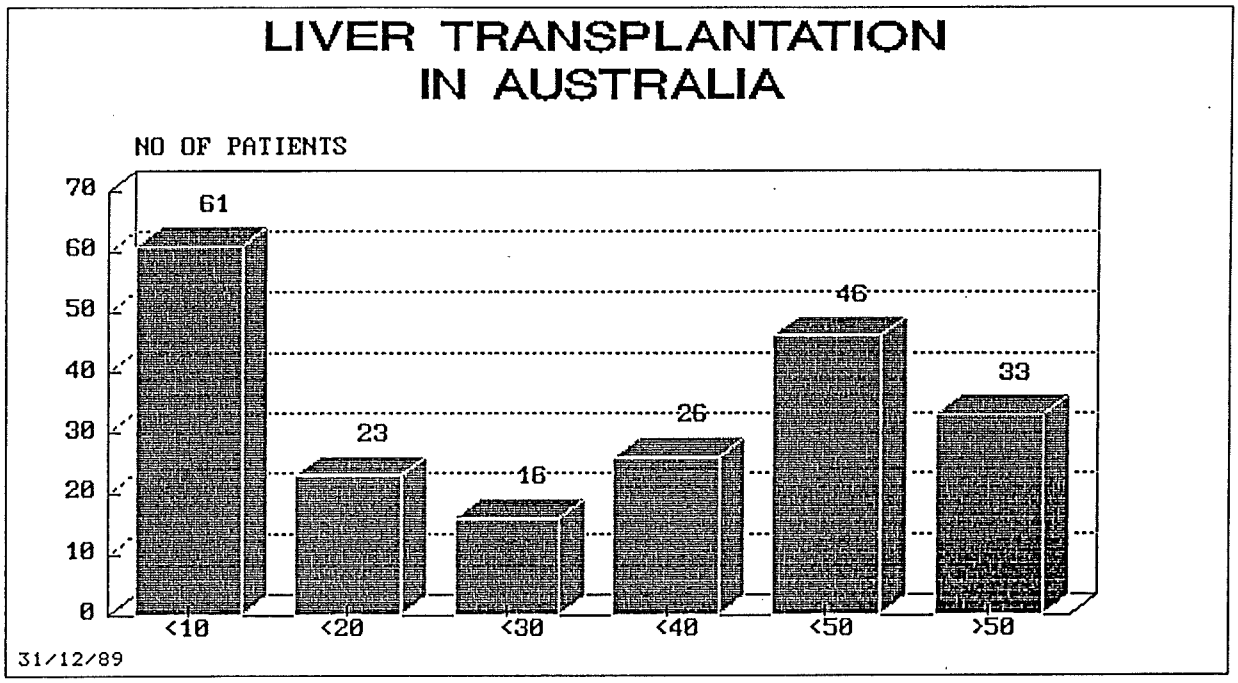


Fig. 3

The age distribution for liver graft recipients shows a bimodal distribution reflecting the primary diseases for which liver transplantation has been performed. In the paediatric group biliary atresia and metabolic defects are predominant. In adults, end-stage liver failure usually manifests in the over 40 years age groups. As the success of liver transplantation has become recognised, there has been an increasing number of patients over the age of 50 years treated and, recently, over the age of 60 years.

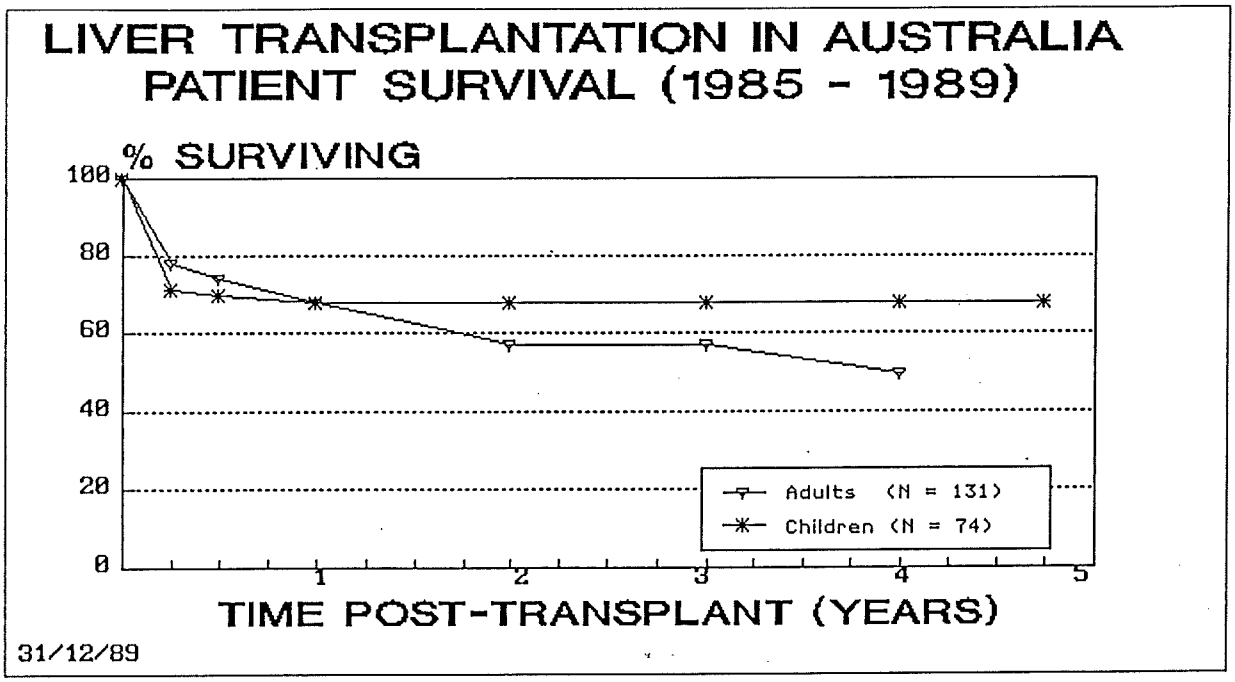


Fig. 4

This graph illustrates overall survival for adult and paediatric patients for the first five years of clinical liver transplantation in Australia. The initial early mortality of 20-30% in the first few months following transplantation is seen in survival data from numerous international transplant centres. This reflects the early complications of major surgery in severely ill patients, early primary graft failure, vascular thrombosis, severe rejection and septic complications in immunosuppressed patients.

It can be seen that in paediatric recipients, survival figures of 70% at 6-12 months are maintained thereafter. In contrast, the adult survival curve shows a continuing gradual patient loss, which can be attributed to chronic rejection, complications of immunosuppression (viral or bacterial sepsis), underlying cardiovascular disease, and recurrence of the original disease in some patients especially those receiving grafts where hepatic malignancy was the reason for transplantation.

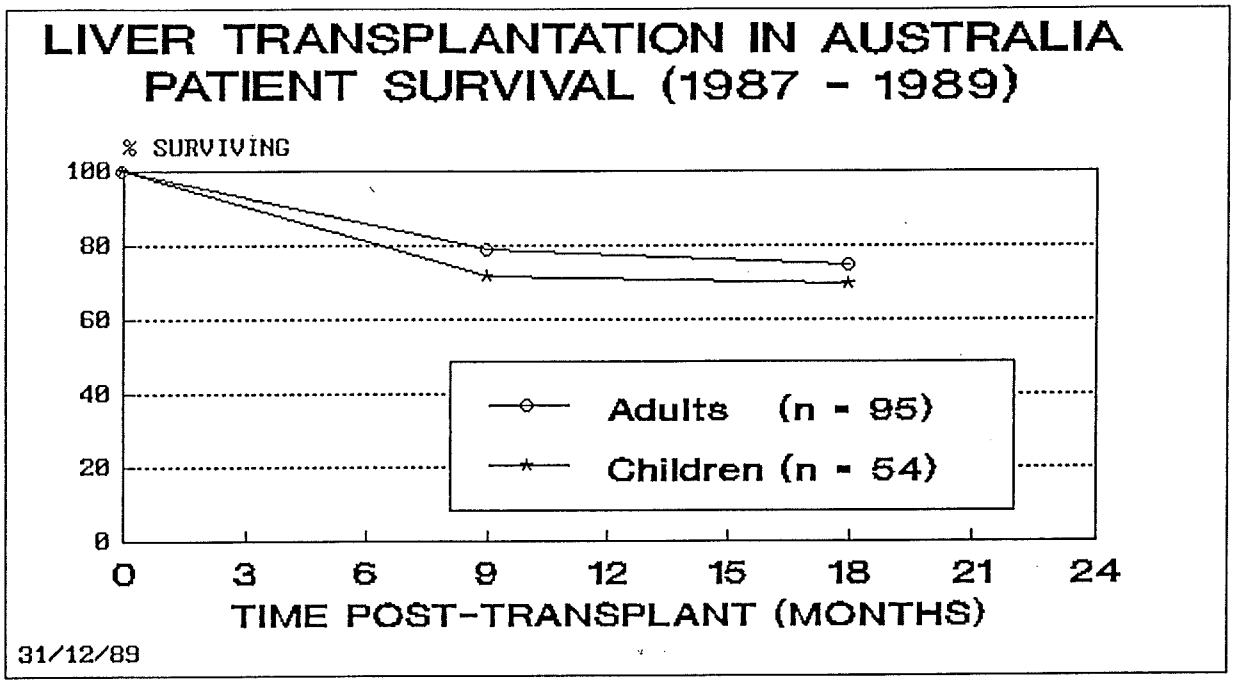


Fig. 5

Patient survival data for the last two years shows little change though there may be some improvement in the outlook for adult recipients where the 2 year survival is 68%. This probably reflects earlier referral of patients with end-stage liver disease, a reduction in the number of patients receiving grafts because of hepatic malignancy, and increasing experience. The early mortality remains unchanged.

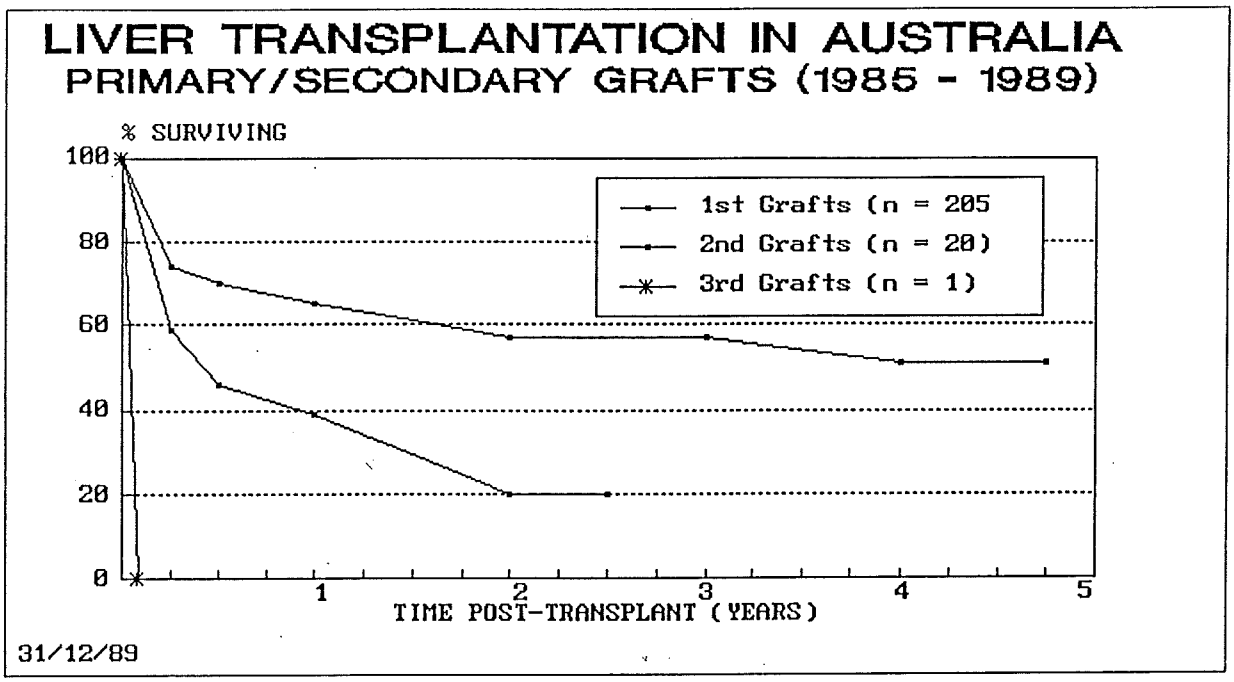


Fig. 6

Graft survival data for the first five years of the Australian experience are shown. At 4 years 53% of primary grafts are functioning. The relatively poor outlook for second grafts reflects the technical difficulties of revisional surgery often performed in desperately ill patients. A single third graft was unsuccessful.

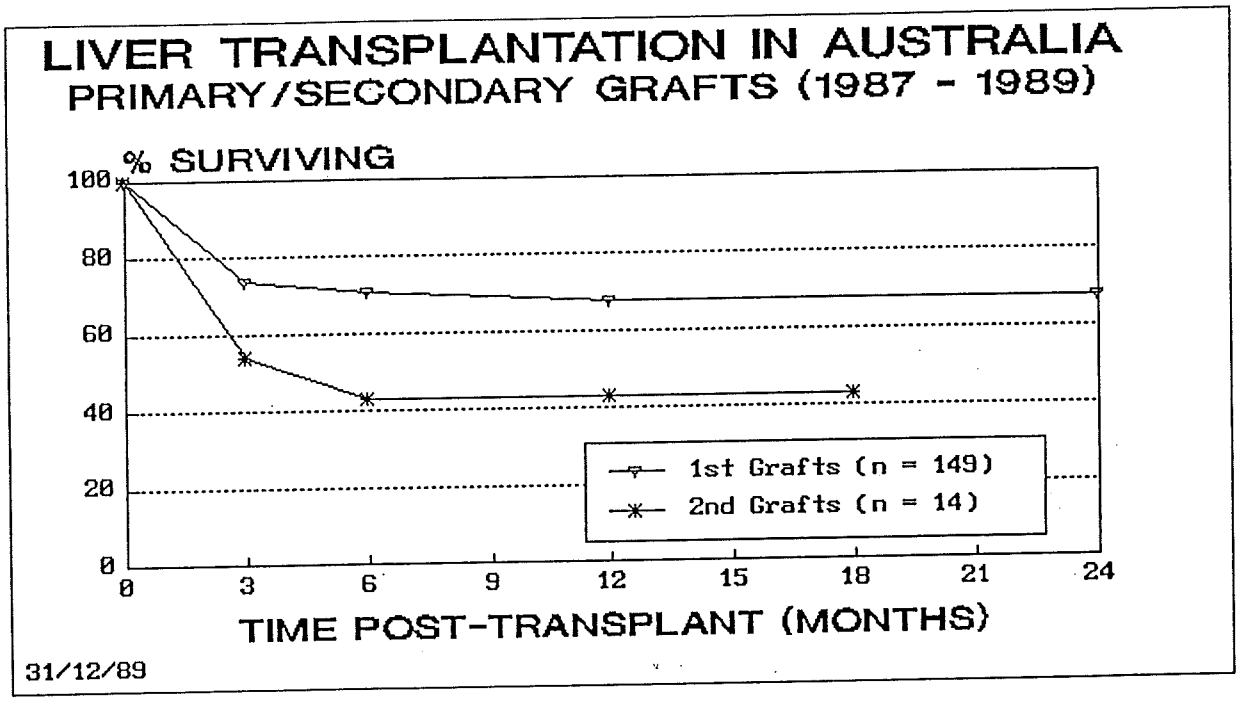


Fig. 7

Data for the past 2 years show an improving survival curve for first grafts, with 70% functioning at 2 years. The early failure rate for second grafts remains unchanged.

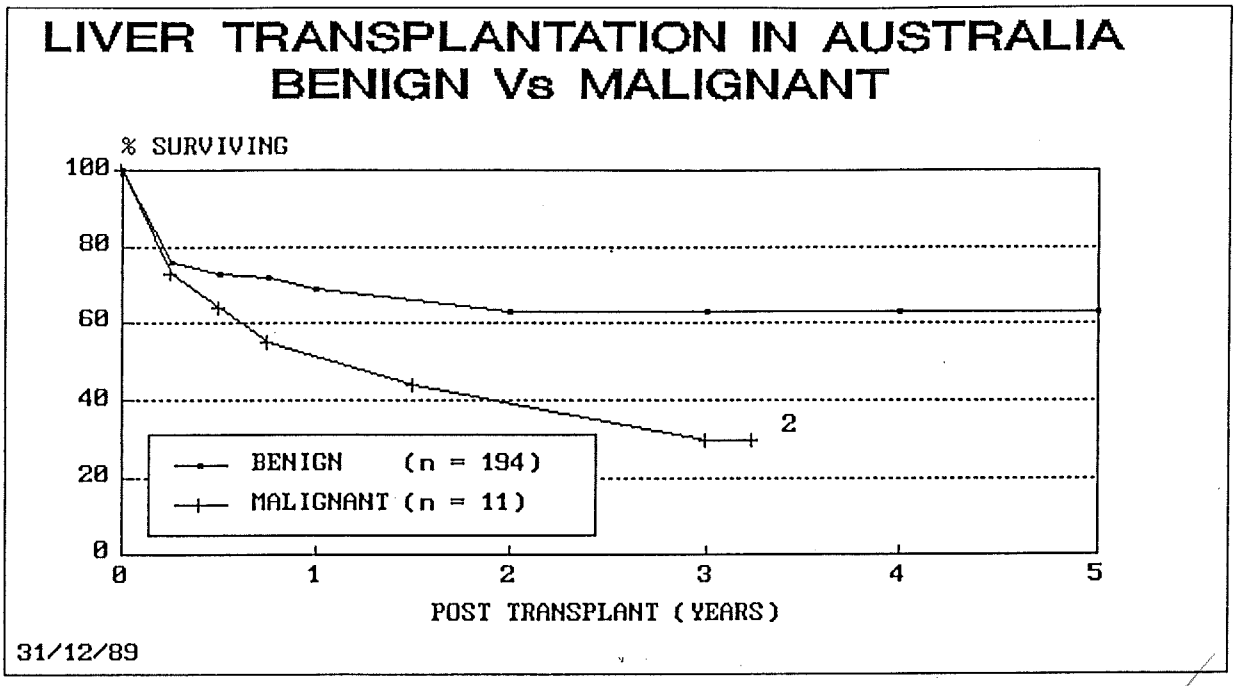
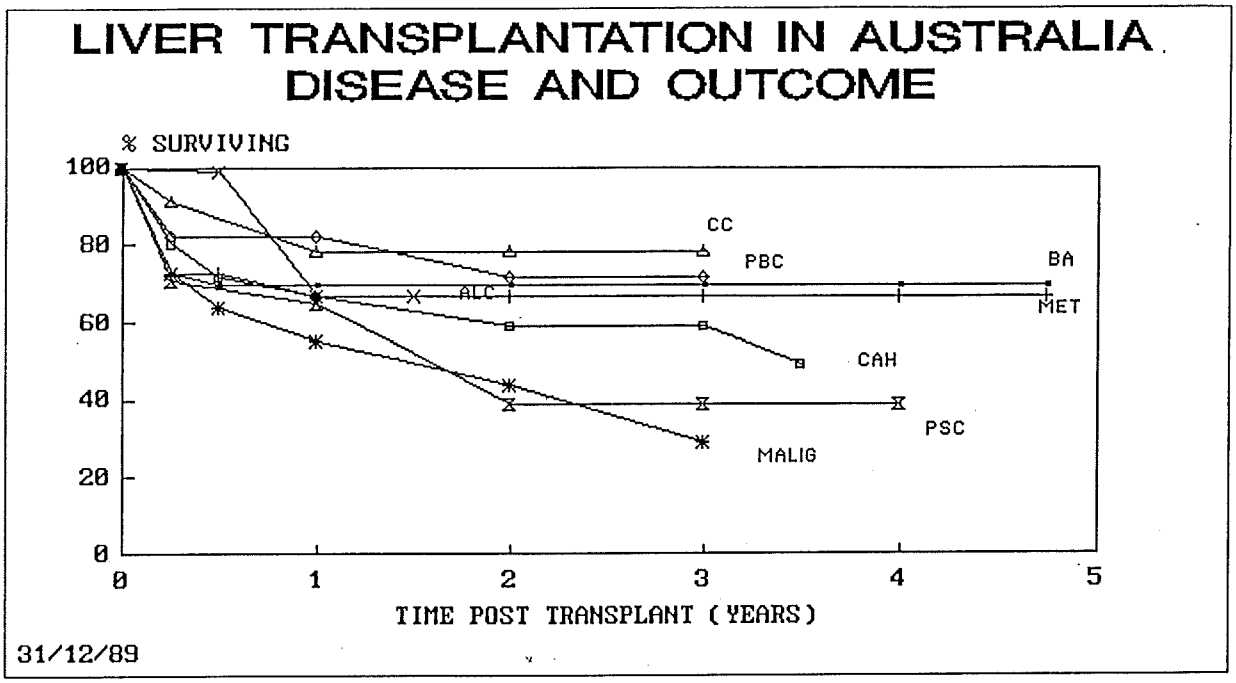


Fig. 8

The distinct difference between outcome for those patients treated for benign conditions causing liver failure and the small number whose reason for transplantation was malignant disease is well seen. The two patients in the group with malignancy who are surviving beyond 3 years following transplantation both had the fibromellar variant of primary hepatocellular carcinoma.



CC - Cryptogenic cirrhosis (n = 11)
PBC - Primary biliary cirrhosis (n = 18)
BA - Biliary atresia (n = 59)
MET - Metabolic disorders (n = 23)
ALC - Alcoholic cirrhosis (n = 6)
CAH - Chronic active hepatitis (n = 35)
PSC - Primary sclerosing cholangitis (n = 25)
MALIG - Malignancy (n = 11)

Fig. 9

The outcome for patients according to the underlying liver condition which caused the need for transplant is shown. Those with cryptogenic cirrhosis, primary biliary cirrhosis, children with biliary atresia and adults and children with metabolic disorders survive best, in the 70% - 80% range. Patients with chronic active hepatitis have a 60% 2 year survival. Patients with primary sclerosing cholangitis and those with malignant disease do least well, having a 2 year survival of 40%.

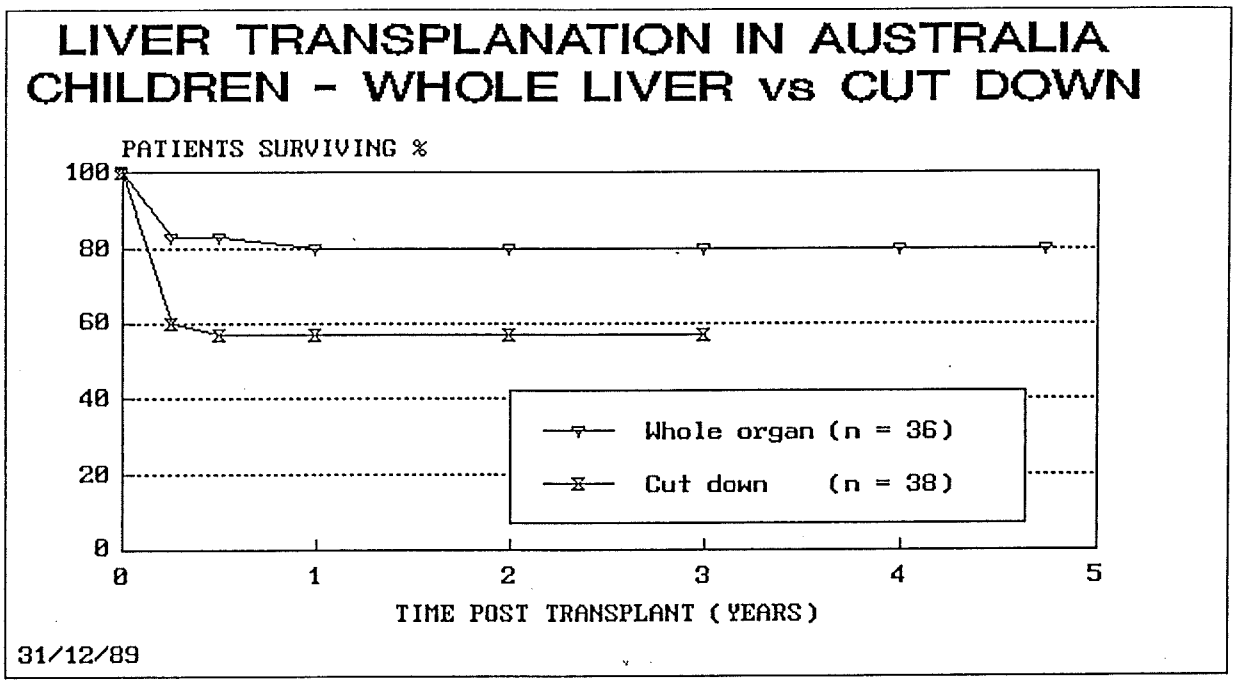


Fig. 10

The results of liver transplantation for children who receive whole livers are compared to those who receive adult livers which are reduced in size. It can be seen that, although the latter technique has allowed the treatment of double the number of patients, it carries additional threats.